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09/538,700	03/30/2000	Stephen J Sicola	P00-2938	8704

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EXAMINER

DUNCAN, MARC M

ART UNIT PAPER NUMBER

2184

DATE MAILED: 06/02/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/538,700

Applicant(s)

SICOLA ET AL.

Examiner

Marc M Duncan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**FINAL REJECTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanai et al.

Referring to claim 1:

Yanai teaches storing, on a log unit in primary cache memory in the first array controller, the data and associated command for every write transaction that occurs between the host computer and the local array, wherein the primary cache is mirrored in backup cache memory in the second array controller (Fig. 1, col. 7 lines 7-11).

Yanai also teaches sending the data to a remote storage system to create a remote copy (col. 7 lines 7-11).

Yanai further teaches, in case of failure, the method of reading the data from the backup cache for each transaction in the log unit and writing the data to the remote storage system in transaction order (col. 7 lines 62-64 and col. 8 lines 33-35).

Referring to claim 2:

Yanai teaches the step of sending the host computer a write completion status message prior to sending the data to the remote storage system (col. 6 lines 26-32).

Referring to claim 3:

Yanai teaches the writing step including performing transaction order merging of the data on the log unit with the data previously stored on the remote storage system to return the data on the local storage system and the remote storage system to a consistent data state (col. 8 lines 33-35).

Referring to claim 4:

Yanai teaches continuing to write the data from the host computer to the log unit while the merging is being performed (col. 8 lines 24-25 and lines 31-35, col. 6 lines 28-28 "asynchronously").

Referring to claim 5:

Yanai teaches the log unit comprising a storage set considered as a logical unit by the array controller (Fig. 1 and col. 7 lines 9-11).

Referring to claim 6:

Yanai teaches the data written by the host computer being stored in cache memory in the first array controller in transaction order (Fig. 2 and col. 7 lines 7-11).

Referring to claim 7:

Yanai teaches the second array controller communicating with the first array controller to determine when the first array controller fails (Fig. 1 and col. 8 lines 21-24).

Referring to claim 8:

Yanai teaches the data written by the host computer being written in asynchronous mode (col. 6 lines 25-31).

Referring to claim 9:

Yanai teach the remote storage system being unavailable due to a situation wherein either the at least one link has failed, the remote site is down or a site failover has occurred (col. 5 lines 6-10 and col. 8 lines 21-24).

Referring to claim 10:

Yanai teaches storing the data for each write transaction from the host computer in mirrored cache memory in both the first array controller and the second array controller (Fig. 1, col. 7 lines 7-11), storing command information including the LBN extent associated with the data in a log in mirrored cache memory in both the first array controller and the second array controller (Fig. 1, col. 7 lines 7-11), sending a write completion status to the host (col. 6 lines 26-32) and sending the data to the remote system (col. 6 lines 26-32), wherein, if the first controller fails before the data is successfully copied to the remote storage system, merging the data, stored on the log, with the backup copy in the remote storage system, in response to commands issued by the second array controller, by using the command information stored in the log to write the data associated therewith to the remote data storage system in the order in which each said write transaction originally occurred (Fig. 2 and col. 7 lines 7-11 and 62-62, col. 8 lines 33-35).

Referring to claim 11:

Yanai teaches merging the data, stored on the log, with the backup copy in the remote storage system, in response to commands issued by the first array controller, by using the command information stored in the log to write the data associated therewith

to the remote data storage system in the order in which each said write transaction originally occurred (Fig. 2 and col. 7 lines 7-11 and 62-62, col. 8 lines 33-35).

Referring to claim 12:

Yanai teaches the second array controller communicating with the first array controller to determine when the first array controller fails (Fig. 1 and col. 8 lines 21-24).

Referring to claim 13:

Yanai teaches the data written by the host computer being written in asynchronous mode (col. 6 lines 25-31).

Referring to claim 14:

Yanai teaches the data written by the host computer being stored in cache memory in the first array controller in transaction order (Fig. 2 and col. 7 lines 7-11).

### ***Response to Arguments***

Applicant's arguments filed 13 May 2003 have been fully considered but they are not persuasive.

In response to applicant's argument that the cited reference does not teach the claimed method wherein the first array controller fails as claimed in claims 1 and 10, the examiner disagrees. The cited reference, in columns 7 and 8, discusses the operations occurring in both the primary and secondary storage systems. The reference goes on to state that the method is utilized when either a primary or secondary device, referred to by reference numbers 134 and 136, cannot be written to. In the drawings it can be seen that reference numbers 134 and 136 refer to M1 and M2. The reference, in column 7, stated that "the M1 bit will refer to the primary data storage system and the

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M2 refer to the secondary data storage system.” It can be seen, therefore, that when the reference refers to a situation when either of the devices (134 or 136) cannot be written to, it necessarily incorporates a situation in which the first array controller fails.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc M Duncan whose telephone number is 703-305-4622. The examiner can normally be reached on M-T and TH-F 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on 703-305-9713. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

md  
May 27, 2003



ROBERT BEAUSOLIEL  
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